

doors each day, even while in bed, and wide open windows for sleeping are compulsory.

About the time the patient begins to sit up, some work, as sewing or knitting, is recommended for an hour or so a day, the patient propped with pillows while in bed.

Reading aloud for increasing periods to two hours per day is taken up early in the cure. The patient is permitted to read, under supervision as to time and subject, and in all things is gradually led back, under the doctor's ordering, to normal life and intercourse.

It must, of course, be understood that this routine only holds for certain cases. Dr. Barker considers that it is extremely important to individualize, and it is rare that any two patients are treated exactly alike.

THE NEWER TREATMENT OF CEREBRO-SPINAL MENINGITIS *

BY V. M. MACLELLAN, R.N.

Graduate of Johns Hopkins Hospital Training School

DURING the epidemics of cerebro-spinal meningitis which occurred in different places between 1904 and 1907, an organism discovered by Weichselbaum in 1887, was proven beyond question to be the cause of the disease, although the mode of infection in man is still unknown. At the Rockefeller Institute in New York, Dr. Flexner and his associates began a series of experiments with monkeys and guinea pigs, in which the infection can be controlled, with the hope of producing an efficient antiserum, and they succeeded in getting one which checked the symptoms and apparently cured the infected animals. After many experiments with animals the serum was used in cases of epidemic meningitis with such results as would seem to justify its further use.

The serum in use has been procured by inoculating a horse, at first subcutaneously, with dead bacilli, then intravenously with living bacilli, which have been obtained from different parts of the country, and increasing the dose each week until the animal is immune. The serum is in one strength, a reddish yellow fluid, and is supplied to physicians who will use it under direction and make a report of the cases treated.

The serum is usually warmed to body temperature and injected into the spinal canal after the withdrawal of a variable amount of the

* Read at the fifth annual meeting of the Maryland State Association of Graduate Nurses.

spinal fluid. When a glass tube with a small bore is attached to the lumbar puncture needle, the fluid rises in a normal person to a height of from eighty to one hundred and twenty millimetres, but in cases of meningitis it rises to four hundred or five hundred millimetres or over. Fluid is withdrawn until the pressure, as it is called, drops below normal and then the serum is slowly injected. The maximum dose at present is thirty cubic centimetres. Serum is given in new cases every day for three or four days, and after that on indication as, for instance, by a rise in temperature or a return of the symptoms, which usually subside after the first or second injection.

There is a question as to the way in which the serum acts, whether by killing the bacteria or counteracting the toxin. After the first dose the bacteria, if found, are usually in a degenerated state, and do not grow in the culture tube. In cases where there are sudden rises in temperature it is usually possible to grow the bacilli after each one.

The cases recover by lysis or crisis in about equal proportion. It seems that the serum has no effect with the so-called fulminant type, which runs a very short course with extreme symptoms; nor in the chronic cases where the symptoms are due to change in the tissues; but in new cases, where it is possible to obtain active living organisms, the serum does seem to cure.

Dr. Flexner reports forty-seven cases treated, of whom thirty-four recovered and thirteen died. Of the thirteen, four were of the fulminant type,—the record is really nine deaths, or twenty per cent. mortality, contrasted with about sixty-five per cent., which is the case without serum treatment. A most striking instance occurred in Akron, Ohio, in April, 1907, where there was an epidemic of about twenty-one cases. Of nine cases treated in the hospital with serum, one died, and eight recovered; but of nine outside cases, not treated with serum, eight died. This does not include three of the fulminant type which died. Of two cases now under treatment at the Johns Hopkins Hospital, one, a child of five years, from the south, was admitted in the sixth week of the disease. He was in a very nervous state, not delirious, but on being touched would cough or make a sound that was very much like the bark of a small dog, and this he had been doing for a long time. His neck and back were rigid, knees flexed, eyes crossed. He was first admitted to the private wards and then transferred to the isolated ward on account of the disturbance he made with the peculiar cough or bark which was kept up at first during a large part of each day. The child was kept in a room by himself with a special nurse, and the room darkened a little as the ordinary amount of light seemed to

hurt his head and eyes. He was kept perfectly quiet, his mother was not permitted to visit him, and as few people as possible entered the room. The diet was liquid until the temperature dropped. The first lumbar puncture was done on the day after admission for the purpose of diagnosis, and the bacilli were grown in a culture although they could not be seen in a "smear" under the microscope. On each of the following days a lumbar puncture was done and the anti-meningitis serum injected under chloroform anaesthesia. The child was very uncomfortable after each one of these injections for five or six hours, crying with pain in his head, but his general condition seemed improved. The third and last injection was given two days later, and the improvement in the child's condition was steady and uninterrupted. It is now about five weeks since his admission and he is up in a chair and is to go home within the next few days. He is still very nervous and gets much wrought up when things disturb him, but his mother says he has always been a nervous child.

The second case admitted was a boy from the city of about sixteen years of age. His illness began with a cold and cough about December 18th. He was working in an office and continued at work until December 28th, when he found it necessary to give up and go home at noon with severe frontal headache. During the night he had three convulsions, and the next day rigidity of back, retraction of head and the flexion of the knees. He was admitted to the hospital on the night of the 31st with a temperature of over 103° F. and a pulse of between 180 and 200. The day after the first injection of serum his pulse dropped to 80. His treatment was similar to that of the first patient, but the course of the disease was slower. He was irrational, and during the second injection of serum his pulse became weak, although not rapid. On the fourth day after admission he became rational,—at least he recognized his mother and knew where he was. His symptoms have cleared up gradually, but at three stated intervals his temperature rose above 103° F. and in each instance after a dose of serum was given, the temperature became normal. He was extremely sensitive on being touched when he first became rational and had to be handled very gently. Both of these patients had ear complications,—tenderness and deafness in one ear,—which were relieved by puncturing the ear drums and having the ears irrigated with boracic acid solution, strength 50 per cent., three times a day. The boy's temperature has now been normal for two weeks, and he says he feels perfectly well except for weakness. He has been sitting up in bed with a back rest for the last two days and is to be sent home this week, as he lives in the city, for his convalescence.

Since the writing of this article two new cases have been admitted to the ward and treated successfully with the serum. Last year a case was treated by Dr. Cushing which recovered and is described in Dr. Flexner's article in the *Journal of Experimental Medicine* for January, 1908. Another case was admitted and, although treated, died very soon after admission, so that the record here at the Johns Hopkins Hospital is of five recoveries out of six cases treated.

There have been too few cases reported to admit of the drawing of any conclusions, but the reports so far are encouraging and the results would seem to justify the further use of the serum until the efficiency of it as a cure for meningitis is established.

LESSONS IN DIETETICS *

By MARY C. WHEELER

Graduate of the Illinois Training School for Nurses and of the Hospital Economics Course

THE kitchen is a cooking laboratory and the same exactness, accuracy, and precision are necessary for success as in all experiments in the chemical laboratory. Air and food are the two most important factors in sustaining life and providing the necessary heat and energy. All foods should be clean, properly preserved, and so cooked that they are in a fit condition to become assimilated by the stomach and intestines and to preserve their natural flavor.

FUELS

Any combustible matter which feeds flame is a fuel. Kinds of such matter are classed as follows:

1. Fluids.
 - a. Gases. (Illuminating gas.)
 - b. Liquid. (Alcohol, gasoline, kerosene.)
2. Solids.
 - a. Wood.
 - b. Charcoal.
 - c. Peat.
 - d. Coal.
 1. Bituminous.
 2. Anthracite.

* As prepared for the pupils of the Blessing Hospital, Quincy, Illinois, from various sources, including Hutchinson's Food and Dietetics and the Lectures of Drs. Vulte and Bigelow.